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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Patrick Teo

Application No: 09/378,398

Filed: August 20, 1999

For: VIRTUAL REALITY CAMERA

)
)
) Attorney Docket No: ROXIP262
)
) Group Art Unit: 2613
)
) Examiner: Lee, Richard J.
)
) Date: May 24, 2004
)

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TRANSMITTAL OF APPEAL BRIEF
(PATENT APPLICATION -- 37 CFR 192)

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This Appeal Brief is in furtherance of the Notice of Appeal filed in this case on February 20, 2004. The Notice of Appeal was received by the USPTO on February 23, 2004. Therefore, the due date for this Appeal Brief is May 24, 2004, including a one-month extension requested herewith. This Appeal Brief is transmitted in triplicate:

This application is on behalf of:

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PATENT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

EX PARTE Patrick Teo

Application for Patent

Filed August 20, 1999

Application No. 09/378,398

FOR:

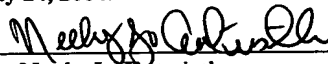
VIRTUAL REALITY CAMERA

APPEAL BRIEF

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Attorneys for Applicants**



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APPENDIX A - CLAIMS ON APPEAL

I. REAL PARTY IN INTEREST

The real party in interest is Roxio, Inc., the assignee of the present application.

II. RELATED APPEALS AND INTERFERENCES

The undersigned is not aware of any related appeals or interferences.

III. STATUS OF THE CLAIMS

Claims 1-37 are pending in the subject application. Claims 38-122 have been canceled. Claims 1-37 have been finally rejected and are on appeal.

IV. STATUS OF THE AMENDMENTS

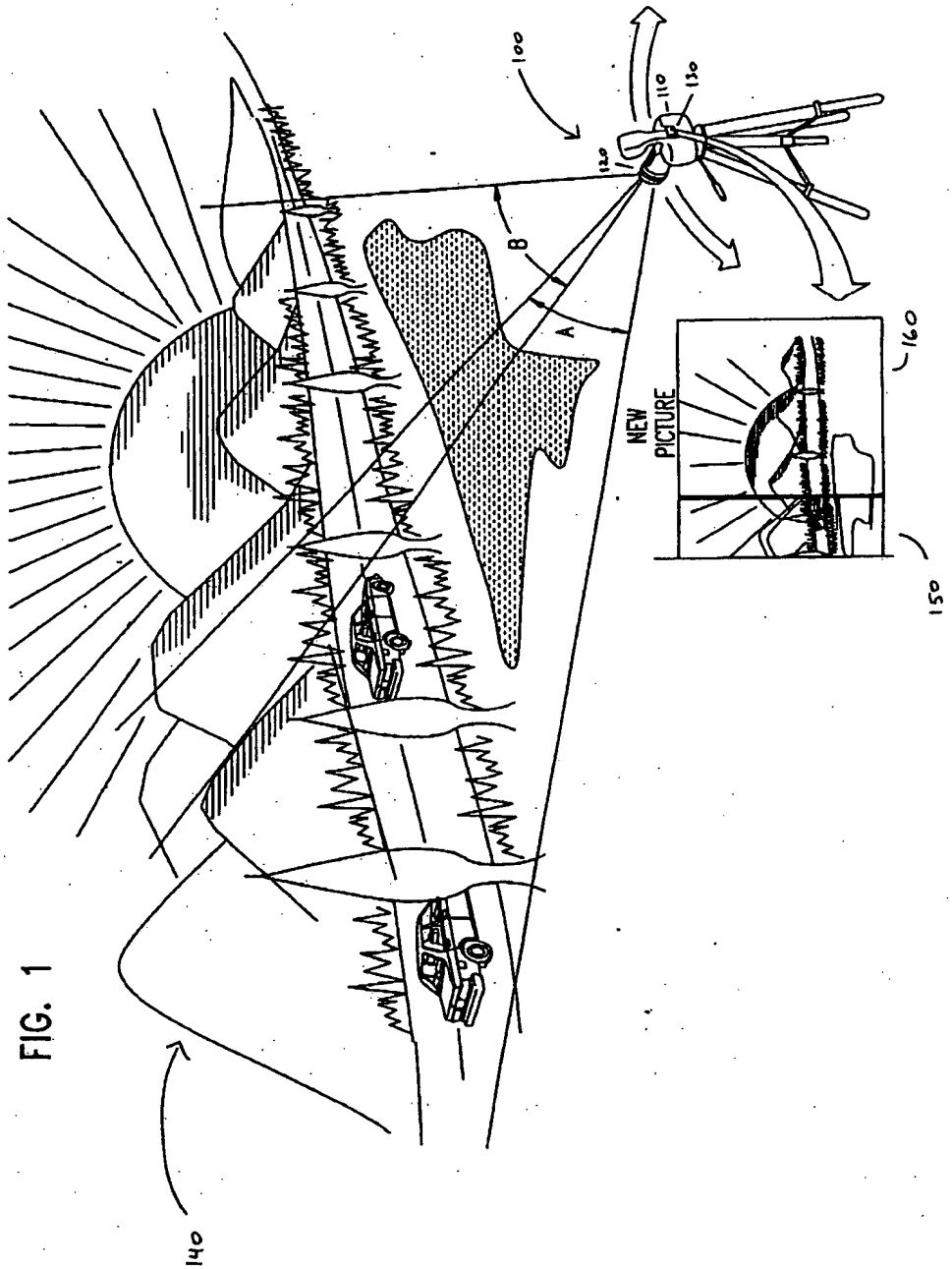
Applicant has not submitted any amendment subsequent to final rejection.

V. SUMMARY OF THE INVENTION

The subject invention is directed towards a camera that produces panoramic images. The camera can acquire multiple fields of views and combine the views to form a panoramic image. Specifically, the camera includes a camera lens and a viewfinder. In one example, the camera acquires a first field of view when the camera lens is in a first orientation and acquires a second field of view when the camera lens is in a second orientation. To accurately align successive fields of view, the viewfinder of the camera displays the second field of view and also displays a portion of the first field of view, whereby the portion of the first field of view is at least partially composited with the second field of view.

The following Figure 1 is an exemplary illustration of the camera producing a panoramic image. As shown in Figure 1, camera 100 first acquires a first field of view when the camera is in a first orientation designated by angle A. After the first field of view is acquired, the camera 100 is rotated to a second orientation designated by angle B. To accurately align a second field of view of the second orientation with the first

field of view, the camera 100 composites a portion from the first field of view 150 onto the second field of view 160 in viewfinder 130. Thus, viewfinder 130 displays simultaneously both a portion from the first field of view 150 and current second field of view 160 to enable a photographer to see the relative alignment between the first and second fields of view. When the first and second fields of view are in alignment, the photographer takes a picture and acquires the second field of view.



VI. ISSUE

- A. Whether Claims 1-8, 12, 14-16, 18, 20, 23, 24, 27, 29-31, and 35-37 are Patentable under 35 U.S.C. § 102(e) over Dunton et al. (U.S. Patent No. 6,304,284).
- B. Whether Claims 9-11, 25, and 26 are Patentable under 35 U.S.C. § 103(a) over Dunton et al.; Claims 13 and 28 are Patentable under 35 U.S.C. § 103(a) over Dunton et al. in view of Inoue (U.S. Patent No. 6,144,804); Claims 17 and 21 are Patentable under 35 U.S.C. § 103(a) over Dunton et al. in view of Kang et al. (U.S. Patent No. 6,256,058); Claims 19 and 22 are Patentable under 35 U.S.C. § 103(a) over Dunton et al. in view of Dube et al. (U.S. Patent No. 6,269,144); Claims 32 and 33 are Patentable under 35 U.S.C. § 103(a) over Dunton et al. in view of Truc et al. (U.S. Patent No. 6,268,936); and Claim 34 is Patentable under 35 U.S.C. § 103(a) over Dunton et al. in view of Truc et al. and Yue et al. (U.S. Application Publication No. US2002/0175924).

VII. GROUPING OF THE CLAIMS

For purposes of this appeal only, claims 1-30 and 35-37 stand or fall together, claims 31-32 stand or fall together, and claims 33-34 stand or fall together.

VIII. ARGUMENTS

- A. **Dunton et al. Do Not Describe the Subject Matter of Claims 1-8, 12, 14-16, 18, 20, 23, 24, 27, 29-30, and 35-37.**

Claims 1-8, 12, 14-16, 18, 20, 23, 24, 27, 29-30, and 35-37 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,304,284 to Dunton et al.

As will be fully explained below, Applicant respectfully asserts that Dunton et al. fail to identically describe or disclose each and every element of the claimed invention, as defined in independent claim 1.

Independent claim 1 defines a viewfinder displaying a second field of view and at least a portion of a first field of view at least partially composited with the second field of view. In support of the 35 U.S.C. § 102(e) rejection, the Examiner noted that Dunton et al. teach “a proper amount of overlap between sequential images is being

displayed on the LCD of the viewfinder” (see Final Office Action mailed November 20, 2003 at page 4). Applicant respectfully traverses the Examiner’s characterization in this regard because the portion of the reference relied upon by the Examiner (column 8, lines 11-62) does not teach the viewfinder displaying the second field of view and at least a portion of the first field of view at least partially composited with the second field of view, as defined in independent claim 1. Specifically, Dunton et al. disclose a processor of a camera, which keeps track of the movements of the camera, that outputs visual signals through a viewfinder or outputs a sound signal “prompting the user to maintain the proper amount of overlap between sequential images” (column 8, lines 24-26 and lines 38-39). In other words, the processor uses “verbal or visual prompt for user to move to optimum position ... for the recording of a subsequent image” (Figure 5, block 516; column 8, lines 58-59). The prompts may be given in the form of “arrows displayed in the camera viewfinder” or in the form of a voice signal prompting the user to move the camera in a particular direction (column 8, lines 13-14 and column 8, line 38). Thus, in accordance to Dunton et al., after the user takes a first image, the camera uses arrows or voice signals to prompt the user to move the camera to a desired point calculated by the processor to take a second sequential image.

In contrast, independent claim 1 defines the viewfinder displaying the second field of view and at least a portion of the first field of view. Instead of displaying a portion of the first image along with the second sequential image in the viewfinder, Dunton et al. rely on arrows or voice signals to signal the user to move the camera in a particular direction. In fact, Dunton et al. mention the term “viewfinder” only once throughout the entire specification, and that portion of the specification only teaches “arrows displayed in the camera viewfinder” (column 8, line 13). Since the portion of the reference relied upon by the Examiner merely discloses arrows displayed in the

viewfinder, Dunton et al. cannot reasonably be considered to disclose the viewfinder displaying the second field of view and at least a portion of the first field of view at least partially composited with the second field of view, as defined in independent claim 1.

As Dunton et al. fail to disclose each and every element of the claimed invention, Applicant respectfully submits that independent claim 1 is patentable under 35 U.S.C. § 102(e) over Dunton et al. Further, dependent claims 2-8, 12, 14-16, 18, 20, 23, 24, 27, 29-30, and 35-37, each of which directly or indirectly depends from independent claim 1, are submitted to be patentable under 35 U.S.C. § 102(e) over Dunton et al. for the reasons set forth above. Thus, the rejection of claims 1-8, 12, 14-16, 18, 20, 23, 24, 27, 29-30, and 35-37 under 35 U.S.C. § 102(e) as being unpatentable over Dunton et al. is improper and should be reversed.

B. The Combination of Dunton et al. in View of Inoue, Kang et al., Dube et al., and Yui et al. Would Not Have Suggested to One Having Ordinary Skill in the Art the Subject Matter of Claims 9-11, 13, 17, 19, 21-22, 25, 26, and 28.

Claims 9-11, 25, and 26 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Dunton et al. Claims 13 and 28 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Dunton et al. in view of U.S. Patent No. 6,144,804 to Inoue. Claims 17 and 21 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Dunton et al. in view of U.S. Patent No. 6,256,058 to Kang et al. Claims 19 and 22 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Dunton et al. in view of U.S. Patent No. 6,269,144 to Dube et al.

As discussed above, Dunton et al. cannot reasonably be considered to disclose or suggest the viewfinder displaying a second field of view and at least a portion of a first field of view at least partially composited with the second field of view, as defined

in independent claim 1. Since dependent claims 9-11, 13, 17, 19, 21-22, 25, 26, and 28 directly or indirectly depend from independent claim 1, Dunton et al. in view of Inoue., Kang et al., Dube et al., and Yui et al. do not raise a *prima facie* case of obviousness against the dependent claims. Accordingly, the obviousness rejections of claims 9-11, 13, 17, 19, 21-22, 25, 26, and 28 are improper and should be withdrawn.

C. Dunton et al. and the Combination of Dunton et al. in View of Truc et al. Would Not Have Suggested to One Having Ordinary Skill in the Art the Subject Matter of Claims 31 and 32.

Dependent claim 31 stands rejected under 35 U.S.C. § 102(e) as being anticipated by Dunton et al. Dependent claim 32 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Dunton et al. in view of U.S. Patent No. 6,268,936 to Truc et al. For the same reasons as stated in independent claim 1, Dunton et al. cannot reasonably be considered to teach or suggest the viewfinder displaying the second field of view and at least a portion of the first field of view at least partially composited with the second field of view. Additionally, as will be explained below, Applicant respectfully asserts that Dunton et al. fail to identically describe or disclose each and every element of the claimed invention, as defined in claim 31.

Claim 31 defines the camera having a perspective conversion circuitry for converting a perspective of a portion of the first field of view from the first orientation to the second orientation. In support of the 35 U.S.C. § 102(e) rejection, the Examiner noted that Dunton et al. teach the perspective conversion circuitry. Applicant respectfully traverses the Examiner's characterization in this regard because the portions of the reference relied upon by the Examiner (Figure 1; column 2, lines 50-67; column 6, lines 20-50) do not teach the perspective conversion circuitry for converting a perspective of a portion of the first field of view from the first orientation to the second

orientation, as defined in claim 31. Specifically, column 2, lines 50-67 of Dunton et al. merely disclose the movement of a camera and the use of sensors “to detect lateral acceleration ... to detect rotation 118 and ... to detect tilt.” Camera movement and camera motion detection are simply irrelevant to the subject of converting a perspective, and column 2, lines 50-67 does not disclose anywhere converting a perspective of a portion of the first field of view from the first orientation to the second orientation, as defined in claim 31.

The Examiner also cited to column 6, lines 20-50 in support of the 35 U.S.C. § 102(e) rejection. In this case, column 6, lines 20-50 teaches the determination of corresponding points between two or more images. A corresponding point “is a point or pixel in the first image which corresponds to a point on the subject, and a second point or pixel in the second image which corresponds to the same point on the subject” (column 6, lines 29-32). In one example, Dunton et al. teach a method for determining corresponding positions by having a user select “a point in the first image ... and selects or ‘clicks’ on the corresponding point in the second image” (column 6, lines 40-43). As such, column 6, lines 20-50 teaches the determination of corresponding points between two or more images. In contrast, claim 31 defines the conversion of a perspective of the first field of view from the first orientation to the second orientation. The determination of corresponding points does not involve the conversion of a perspective. Since one portion of the reference relied upon by the Examiner is simply irrelevant and the other portion does not disclose the conversion of a perspective, Dunton et al. cannot reasonably be considered to disclose the perspective conversion circuitry for converting a perspective of a portion of the first field of view from the first orientation to the second orientation, as defined in claim 31.

As Dunton et al. fail to disclose each and every element of claim 31, Applicant respectfully submits that claim 31 is patentable under 35 U.S.C. § 102(e) over Dunton et al. Claim 32 depends on claim 31 is likewise patentable under 35 U.S.C. § 103(a) over Dunton et al. in view of Truc et al. for at least the same reasons set forth above regarding claim 31. Thus, the rejection of claim 31 under 35 U.S.C. § 102(e) as being unpatentable over Dunton et al. and the rejection of claim 32 under 35 U.S.C. § 103(a) as being unpatentable over Dunton et al. in view of Truc et al. are improper and should be reversed.

D. The Combination of Dunton et al. in View of Truc et al. and Yui et al. Would Not Have Suggested to One Having Ordinary Skill in the Art the Subject Matter of Claims 33 and 34.

Dependent claims 33 and 34 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Dunton et al. in view of Truc et al. and U.S. Application Publication No. US2002/0175924 to Yui et al. For the same reasons as stated in independent claim 1, Dunton et al. cannot reasonably be considered to teach or suggest the viewfinder displaying the second field of view and at least a portion of the first field of view at least partially composited with the second field of view. Further, as discussed in claim 31, Dunton et al. cannot reasonably be considered to teach or suggest perspective conversion. Additionally, as will be explained below, the combination of Dunton et al. in view of Truc et al. does not raise a prima facie case of obviousness against dependent claim 33.

Claim 33 defines the perspective conversion circuitry to include a line processing circuitry that determines modified color values at pixel locations within vertical lines of the converted portion of the first field of view based on unmodified color values at a corresponding vertical line of the portion of the first field of view.

In support of the obviousness rejection, the Examiner noted that by referencing Dunton et al. in view of Truc et al., one skilled in the art “would have had no difficulty in providing the color modification of images as taught by Truc et al for the panoramic images of Dunton et al [sic] for the same well known color enhancement purposes as claimed” (see Office Action mailed June 4, 2003 at page 10). Applicant respectfully traverses the Examiner’s characterization of Truc et al. in this regard because the portions of Truc et al. relied upon by the Examiner (Figure 8; column 5, lines 25-36; column 7, lines 26-40) do not teach perspective conversion by determining modified color values at pixel locations within vertical lines of the converted portion of the first field of view based on unmodified color values at a corresponding vertical line of the portion of the first field of view, as defined in claim 33. First, claim 33 defines a circuitry for perspective conversion – not for the purpose of “color modification” as characterized by the Examiner. Second, column 7, lines 26-40 disclose a menu bar displayed on a screen that “includes five pull-down menus labeled ‘File’, ‘Edit’, ‘Setup’, ‘System’, and ‘Help’” (column 7, lines 31-33). “The menu items allow a user to perform a variety of modifications on images 102. For example, a user can modify the color, brightness, contrast, and orientation of the images. A user can also delete images, save images to a disk, and print images” (column 7, 36-40). The functions of a menu bar displayed on a screen is simply irrelevant to the subject of perspective conversion, as defined in claim 33. Further, there is nothing in column 7, lines 26-40 that discloses the determination of modified color values at pixel locations within vertical lines of the converted portion of the first field of view based on unmodified color values at a corresponding vertical line of the portion of the first field of view, as defined in claim 33.

The Examiner also cited to column 5, lines 25-36 in support of the 35 U.S.C. §

103(a) rejection. Column 5, lines 25-36 relates to “finding the boundaries between individual images” (column 5, lines 8-9 and line 33). Truc et al. disclose using the principle of projecting a light “through the film, the light going through the area between the images will have a have a high intensity because there are no silver deposits to block the light” (column 5, lines 12-15). The boundaries between individual images are then determined by calculating “the average intensity of each column of pixels in each digital image” (column 5, lines 33-35). “A high average intensity indicates that the column is a boundary” (column 5, lines 35-36). As such, Truc et al. teach finding boundaries between individual images by calculating the average intensity of each column of pixels. In contrast, claim 33 defines perspective conversion by determining modified color values at pixel locations within vertical lines of the converted portion of the first field of view based on unmodified color values at a corresponding vertical line of the portion of the first field of view. The finding of boundaries simply involves the calculation of the average intensity of each individual column of pixels, and does not depend on unmodified color values at a corresponding column. Furthermore, finding a boundary between images has nothing to do with perspective conversion. Accordingly, Truc et al. cannot reasonably be considered to disclose or suggest to one having ordinary skill in the art perspective conversion by determining modified color values at pixel locations within vertical lines of the converted portion of the first field of view based on unmodified color values at a corresponding vertical line of the portion of the first field of view, as defined in claim 33.

Furthermore, to establish a prima facie case of obviousness based on a combination of references, there must be some suggestion or motivation, either in the references or in the knowledge generally available to one having ordinary skill in the

art, to combine the references in the manner proposed. In this case, the teachings of Dunton et al. focus on a camera system for generating panoramic images. In contrast, the teachings of Truc et al. relate to a film scanner for scanning a film strip. Cameras that take panoramic pictures and film scanners for scanning film strips involve entirely different technologies and applications. As the teachings of Dunton et al. have nothing to do with the problems associated with film scanners addressed by Truc et al., Applicant submits that there would not have been any motivation for one having ordinary skill in the art to combine Dunton et al. and Truc et al. in the manner proposed by the Examiner.

In sum, Applicant respectfully submits that the combination of Dunton et al. in view of Truc et al. does not raise a prima facie case of obviousness against the subject matter defined in dependent claim 33 because 1) the combination is based on an improper characterization of Truc et al., and 2) the requisite motivation to combine Dunton et al. and Truc et al. in the manner proposed by the Examiner is lacking. Accordingly, for at least these reasons, claim 33 is patentable under 35 U.S.C. § 103(a) over the combination of Dunton et al. in view of Truc et al. Claim 34, which depends on claim 33, is likewise patentable under 35 U.S.C. § 103(a) over Dunton et al. in view of Truc et al. and Yui et al. for at least the same reasons set forth above regarding claim 33. Thus, the rejections of claims 33 and 34 under 35 U.S.C. § 103(a) as being unpatentable over Dunton et al. in view of Truc et al. and Yui et al. are improper and should be reversed.

E. Conclusion

For the foregoing reasons, the rejections of claims 1-8, 12, 14-16, 18, 20, 23, 24, 27, 29-31, and 35-37 under 35 U.S.C. § 102(e) and claims 9-11, 13, 17, 19, 21-22, 25, 26, 28, and 32-34 under 35 U.S.C. §103(a) are improper and should be reversed. In formulating the rejection of these claims, the Examiner has improperly characterized the teachings of Dunton et al. and Truc et al. Additionally, when considered objectively without the benefit of Applicant's teachings, the combination of Dunton et al. in view of Inoue., Kang et al., Dube et al., Truc et al., and Yui et al. does not establish a *prima facie* case of obviousness against the claimed invention. Accordingly, Applicant respectfully submits that the anticipation rejections under 35 U.S.C. § 102(e) and obviousness rejections under 35 U.S.C. §103(a) are improper, and requests that the Board of Patent Appeals and Interferences reverse these rejections on appeal.

Respectfully submitted,
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APPENDIX A

CLAIMS ON APPEAL

1. A camera comprising:

a camera lens;

acquisition circuitry receiving images via said camera lens, for acquiring a first field of view when said camera lens is in a first orientation and for acquiring a second field of view when said camera lens is in a second orientation; and

a viewfinder displaying the second field of view when said camera lens is in the second orientation and displaying at least a portion of the first field of view at least partially composited with the second field of view.
2. The camera of claim 1 wherein the second field of view at least partially overlaps the first field of view.
3. The camera of claim 1 wherein a size of the at least a portion of the first field of view is prescribed.
4. The camera of claim 3 wherein the size of the at least a portion of the first field of view is prescribed relative to a size of the first field of view.
5. The camera of claim 3 wherein the size of the at least a portion of the first field of view is prescribed relative to a size of the second field of view.
6. The camera of claim 5 wherein the size of the at least a portion of the first field of view is its width, and the size of the second field of view is its width.

7. The camera of claim 5 wherein the size of the at least a portion of the first field of view is its height, and the size of the second field of view is its height.

8. The camera of claim 5 wherein the size of the at least a portion of the first field of view is the field of view angle it subtends, and the size of the second field of view is the field of view angle it subtends.

9. The camera of claim 5 wherein the size of the at least a portion of the first field of view is prescribed to an amount between 20% and 40% of the size of the second field of view.

10. The camera of claim 1 wherein the at least a portion of the first field of view is composited with the second field of view by an opacity of approximately 50%.

11. The camera of claim 1 wherein the at least a portion of the first field of view is composited with the second field of view by an opacity of approximately 100%.

12. The camera of claim 1 wherein the focus of said camera lens is not changed during acquisition of the first and second fields of view.

13. The camera of claim 1 further comprising a lens focus lock for locking the focus of said camera lens during acquisition of the first and second fields of view.

14. The camera of claim 1 further comprising combining circuitry for combining the first and second fields of view.

15. The camera of claim 14 wherein the first and second fields of view are portions of a scene and wherein said combining circuitry combines the first and second fields of view into a panoramic image of the scene.

16. The camera of claim 15 wherein said panoramic image has a cylindrical geometry.

17. The camera of claim 16 further comprising rectilinear-to-cylindrical conversion circuitry for converting the first and second fields of view from rectilinear coordinates to cylindrical coordinates.

18. The camera of claim 15 wherein said panoramic image has a spherical geometry.

19. The camera of claim 15 further comprising rectilinear-to-spherical conversion circuitry for converting the first and second fields of view from rectilinear coordinates to spherical coordinates.

20. The camera of claim 15 further comprising view control circuitry for selecting a portion of the panoramic image to display, and wherein said viewfinder displays the selected portion of the panoramic image.

21. The camera of claim 20 wherein said panoramic image has a cylindrical geometry and further comprising cylindrical-to-rectilinear conversion circuitry for converting the selected portion of the panoramic image from cylindrical coordinates to rectilinear coordinates.

22. The camera of claim 20 wherein said panoramic image has a spherical geometry and further comprising spherical-to-rectilinear conversion circuitry for converting the selected portion of the panoramic image from spherical coordinates to rectilinear coordinates.

23. The camera of claim 1 wherein said acquisition circuitry acquires at least one additional field of view with said camera lens being in at least one additional orientation, and wherein said viewfinder displays an additional field of view of said camera lens when said camera lens is in each additional orientation and displays at least a portion of at least one previously acquired field of view at least partially composited with the additional field of view.

24. The camera of claim 23 wherein each additional field of view at least partially overlaps the at least one previously acquired field of view.

25. The camera of claim 23 wherein the at least a portion of the at least one previously acquired field of view is composited with the additional field of view by an opacity of approximately 50%.

26. The camera of claim 23 wherein the at least a portion of the at least one previously acquired field of view is composited with the additional field of view by an opacity of approximately 100%.

27. The camera of claim 23 wherein the focus of said camera lens is unchanged during acquisition of the first and second and the at least one additional fields of view.

28. The camera of claim 23 further comprising a lens focus lock for locking the focus of said camera lens during acquisition of the first and second and the at least one additional fields of view.

29. The camera of claim 23 further comprising combining circuitry for combining the first and second and the at least one additional fields of view.

30. The camera of claim 29 wherein the first and second and the at least one additional fields of view are portions of a scene and wherein said combining circuitry combines the first and second and the at least one additional fields of view into a panoramic image of the scene.

31. The camera of claim 1 further comprising perspective conversion circuitry for converting a perspective of the at least a portion of the first field of view from the first orientation to the second orientation.

32. The camera of claim 31 wherein said perspective conversion circuitry includes line processing circuitry for determining modified color values at pixel locations within vertical lines of the converted at least a portion of the first field of view.

33. The camera of claim 32 wherein said line processing circuitry determines modified color values at pixel locations within vertical lines of the converted at least a portion of the first field of view based on unmodified color values at a corresponding vertical line of the at least a portion of the first field of view.

34. The camera of claim 32 wherein said line processing circuitry rescales vertical lines of the at least a portion of the first field of view.

35. The camera of claim 1 further comprising an indicator indicating when said camera lens is in the second orientation.

36. The camera of claim 35 wherein said indicator is a light.

37. The camera of claim 35 wherein said indicator is a beeper.